# Dossier: FLORA MATERIALS LLC

## SBIR Award Details

**Award Title:** N/A

**Amount:** $1,899,942.92

**Award Date:** 2024-09-26

**Branch:** ARMY

## AI-Generated Intelligence Summary

**Company Overview:**

FLORA MATERIALS LLC, based in Stillwater, Oklahoma, is a materials science company focused on developing and manufacturing high-performance cellulose nanocrystals (CNC) and related biomaterials derived from agricultural waste streams, particularly cotton gin waste. Their core mission is to provide sustainable, high-strength, and lightweight materials for a range of industries, offering an alternative to petroleum-based materials and reducing reliance on virgin resources. They aim to solve the problems of material waste, environmental impact associated with traditional materials, and the need for cost-effective, high-performance materials in demanding applications. Their unique value proposition lies in utilizing agricultural waste to produce CNCs with superior mechanical properties, offering a sustainable and economically viable solution for various sectors including aerospace, defense, and composites.

**Technology Focus:**

* Production of Cellulose Nanocrystals (CNC) from agricultural waste, specifically cotton gin waste. Their proprietary process refines the CNCs to achieve high purity and consistent morphology, leading to improved mechanical properties compared to competitor CNC products.
* Development of CNC-reinforced composite materials for applications requiring high strength-to-weight ratio. This includes CNC-enhanced polymers and coatings offering improved impact resistance, thermal stability, and barrier properties.

**Recent Developments & Traction:**

* In 2021, FLORA MATERIALS LLC, under the project name "Cotton Fiber Byproducts to Composites," was awarded $175,000 from the Oklahoma Center for the Advancement of Science and Technology (OCAST).
* FLORA MATERIALS LLC received $1.3 million in Phase II SBIR funding in 2023 from the US Department of Energy to develop high-performance polymer composites using recycled cellulose.
* They are exploring collaboration with defense contractors to test and implement their lightweight and high strength composites to create lighter and more fuel-efficient vehicle body armor.

**Leadership & Team:**

* Ray Huhnke (CEO):\*\* Former Director of the Oklahoma Bioenergy Center. Professor in Biosystems and Agricultural Engineering at Oklahoma State University. Extensive experience in biomass processing, biofuels, and bioproducts.

**Competitive Landscape:**

* CelluForce:\*\* A Canadian company that is one of the world's largest producers of CNC. FLORA MATERIALS differentiates itself through its focus on utilizing cotton gin waste and its proprietary refining process, potentially leading to cost advantages and unique material properties tailored for specific applications, such as defense.
* Melodea:\*\* An Israel-based company specializing in CNC applications for packaging. Flora Materials differentiates itself by its feedstock choice and the focus in developing CNCs for defense and aerospace purposes.

**Sources:**

1. [https://www.ok.gov/ocast/documents/2021%20Final%20SBIR%20STTR%20Awards.pdf](https://www.ok.gov/ocast/documents/2021%20Final%20SBIR%20STTR%20Awards.pdf)

2. [https://www.osti.gov/servlets/purl/1968075](https://www.osti.gov/servlets/purl/1968075)

3. [https://www.globalcotton.org/cotton-this-week-june-24-2022/](https://www.globalcotton.org/cotton-this-week-june-24-2022/)